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ABSTRACT

Two cases are described in which alternative assessments have been successfully employed in college mathematics. Case 1 describes an alternative assessment applied in a class of 10 elementary school teachers studying Euclidean geometry as required by state teacher-certification requirements. One student asserted that he already had an adequate background in the subject. A clinical interview and observation were used to determine the student's level of knowledge and the appropriate instructional practices. In the second case, a clinical interview was conducted to determine the knowledge of one student of basic algebra. This student indicated that she knew the material well and had, in fact, taken the class twice before, but that she could not pass the written tests because of extreme math anxiety. The student's performance in class, on homework, and in tutoring another student was used in place of written test grades. Knowing the test grades would not count toward her class grade, the student achieved a 95% on the comprehensive final. (SLD)

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ALTERNATIVE ASSESSMENT FOR COLLEGE MATHEMATICS

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Presented by Penney Heath to the annual meeting of AERA April 5, 1994

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The following two cases represent situations where alternative assessments for college mathematics were employed with success. **Case One** describes an alternative assessment applied in a class of ten elementary school teachers with a heterogeneous background of knowledge in the course material - Euclidean Geometry, and **Case Two** describes an application in a developmental algebra class.

CASE ONE

A clinical interview was conducted to assess a students knowledge of Euclidean Geometry, to verify his claim that he already had a good background in the subject. The student could not bypass the course by taking a challenging test as it is done in similar cases because, according to the state's requirements for certification, class attendance is mandatory.

ALTERNATIVE ASSESSMENT:

Based on the result of the clinical interview and my personal observation of the student's performance during the first two weeks of class, the following procedure was employed:

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1. The student had to come to class. I made sure that he participated by frequently asking him to come to the board to explain a proof to the other students when he had "another way of doing it". Being an engineer, he did approach problems from a more applied manner. This made class more interesting to him because he was given the oportunity to be a participant instead of sitting for two hours listening (or not listening to things that he already knew).
2. The student was exempted from having to do homework assignments (proofs and problems) and exempted from having to take the final exam on the condition that he would tutor one of the students (with a very poor background in math) on a regular basis.
   Rationale: Having to do homework assignments would have been a redundant and boring activity for the student and he would have considered it a real waste of time. tutoring gave him the opportunity to update and review the material and at the same time constructively used his knowledge to help another student who, in turn, profited tremendously from his help.
3. The student was required to do the short research papers on the lives of different Mathematicians assigned in class.
   Rationale: This activity allowed students (all had to do it) to broaden their knowledge of the subject of mathematics.

4. The student was required to do a research paper and a class presentation. Some topics assigned were:
   a. Proofs of the Pythagorean theorem - to student with a moderate background.
   b. Hyperbolic Geometry - to student with a good background
   c. Elliptic geometry - to student with a good background
   d. Manipilitives in teaching geometry - to student with a poor background.
   e. Tessellations to student with poor background.
   f. Frederick Gauss" Polygon - to student with good background. This subject was assigned to the student because he has enough knowledge to understand the topic and present it appropriately.

The above adjustments resulted in giving the student the pleasure of learning something rather than simply doing busy work for the mere purpose of getting credit towards certification.

CASE TWO

In a developmental algebra class a clinical interview was conducted to assess a student's knowledge of basic algebra. The student informed me on the first day of class that she had taken the class twice before, that she knew the material very well, but that she could not pass the written tests because she suffered from a extreme math anxiety.

ALTERNATIVE ASSESSMENT:

Based on the results of the clinical interview and class observation of the student's performance in class, the following procedure was employed:

The student was requested to do all of the required homework. She was asked to come to the board often and explain mathematical concepts or do exercises. She was told that she had to take the tests but the grade she made on the tests would not hurt her grade. Her performance assessment would be based on the required homework and class participation. The student was also required to tutor one of the students who was having serious problems with the material because of a very poor background.

RATIONALE: The student was requested to do the homework, come to the board, and tutor another student, for the purpose of enhancing her learning of the course material and increasing her confidence. By telling her that her test grades would not count alleviated the math anxiety - she made a average of 85 on the five tests and a 95 on the comprehensive final. (Note: the student she tutored made anaverage of 85 and performed equally well in her next mathematics class - pre-calculus.)